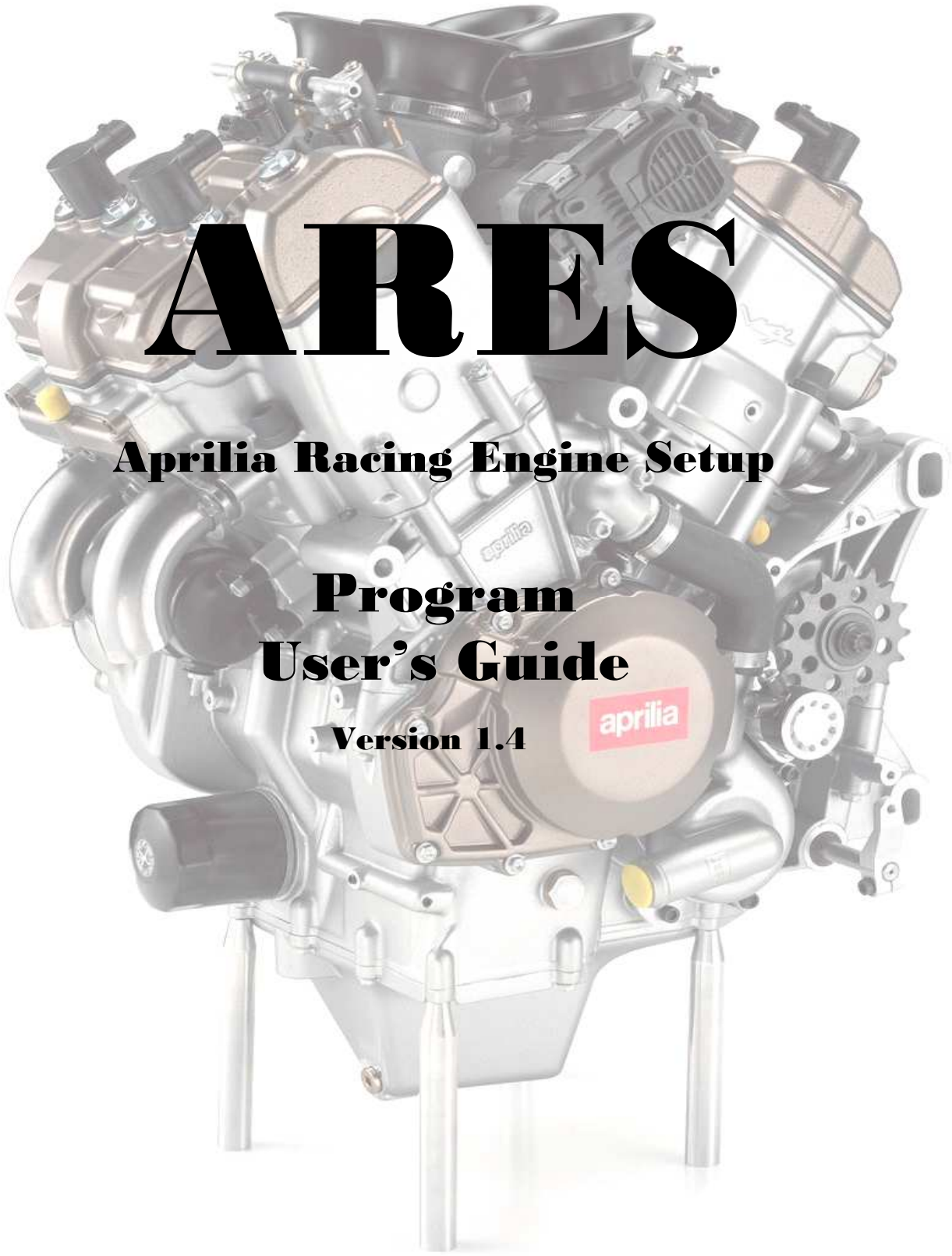
GRUPPO PIAGGIO

aprilia racing



ARES

Aprilia Racing Engine Setup

Program User's Guide

Version 1.4

aprilia

DERBI

GILERA

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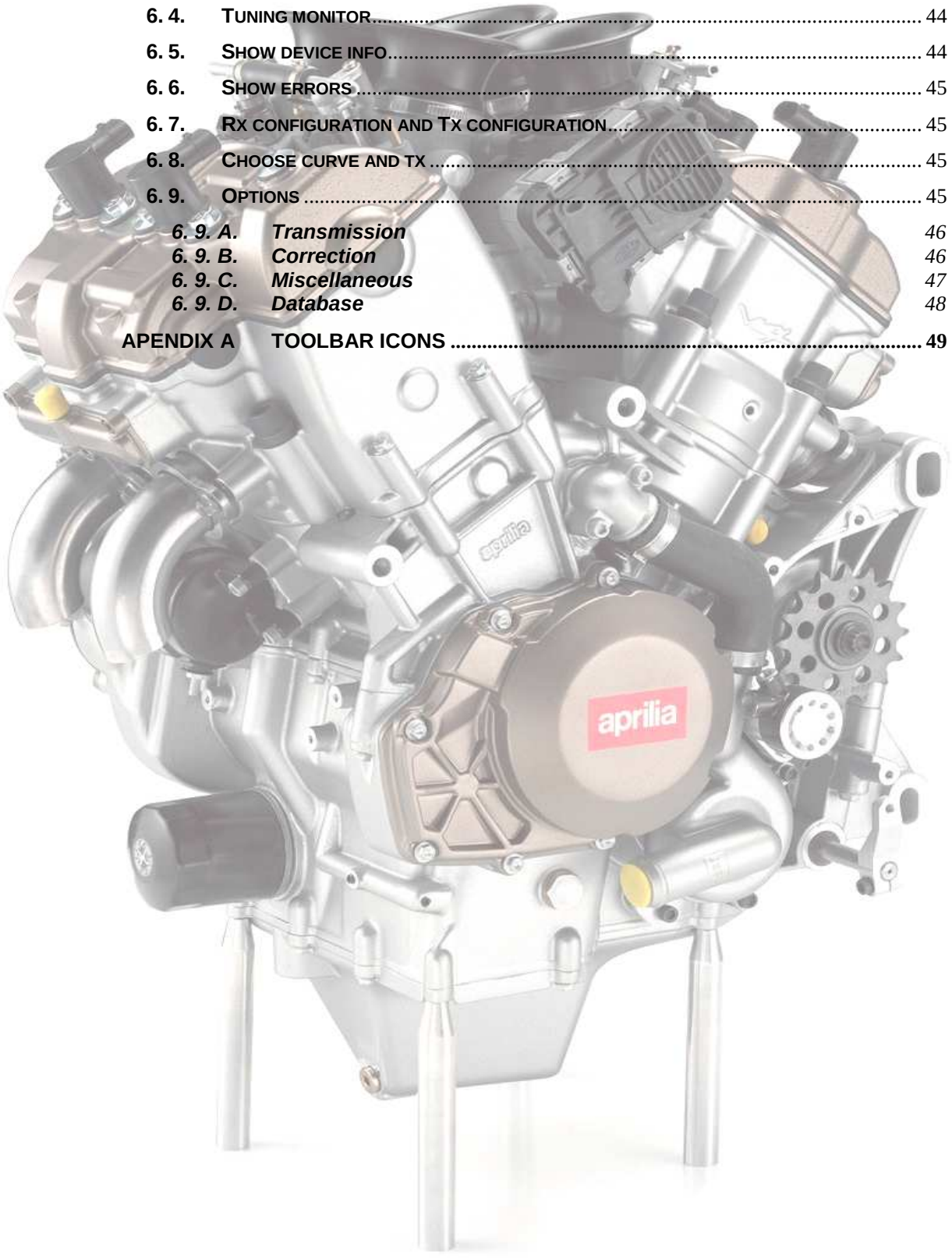


Chapter 1. Introduction

ARES, Aprilia Racing Engine Setup is a software developed by Aprilia Racing S.r.l. in order to control and administer the Aprilia Engine Control Unit (ECU).

All the parameters and adjustments required by the ECU to control the engine (and vehicle) are called “Engine Configuration”, or simply ‘Configuration’.

Therefore ARES allows the user to change the ECU’s configuration in order to optimize several engine and vehicle functions such as the traction control strategy, ride by wire mapping, suspension calibration, etc.

IMPORTANT FOR ETHERNET DOWNLOAD MODE:

In order to configure the Ethernet communication between APX2 and PC it is necessary to configure the internet protocol.

For Windows XP:

1. Right-click **My Network Places**, and then click **Properties**.
2. Right-click the network connection for your network adapter, and then click **Properties**.
3. On the **General** tab, click **Internet Protocol (TCP/IP)**, and then click **Properties**.
4. Click **Use the following IP address**, and then type the next values only in the **IP address**, and **Subnet mask**, boxes.
   IP address: 10.1.xxx.xxx
   where xxx are free numbers, but it is necessary to write numbers.
   Next IP address **are not allow**: 10.1.116.xxx
   10.1.118.xxx
   Subnet mask: 255.255.0.0

For Windows 7:

1. Click **START** button and then **All control Panel Items.**
2. Click on **Network and Sharing Centre.**
3. Then click on the option **Connections: Local Area Connection**.
4. Click on **Properties.**
5. Go to point 3 of Windows XP section.

1.1. Nomenclature List

Important terms must be defined in order to understand the following document:

Curves: group of maps that allow to modify different parameters of the engine like ignition, injection… These parameters are showed in tables.

Parameters: group of internal parameters to set the starting point of the engine. Only for staff Aprilia.

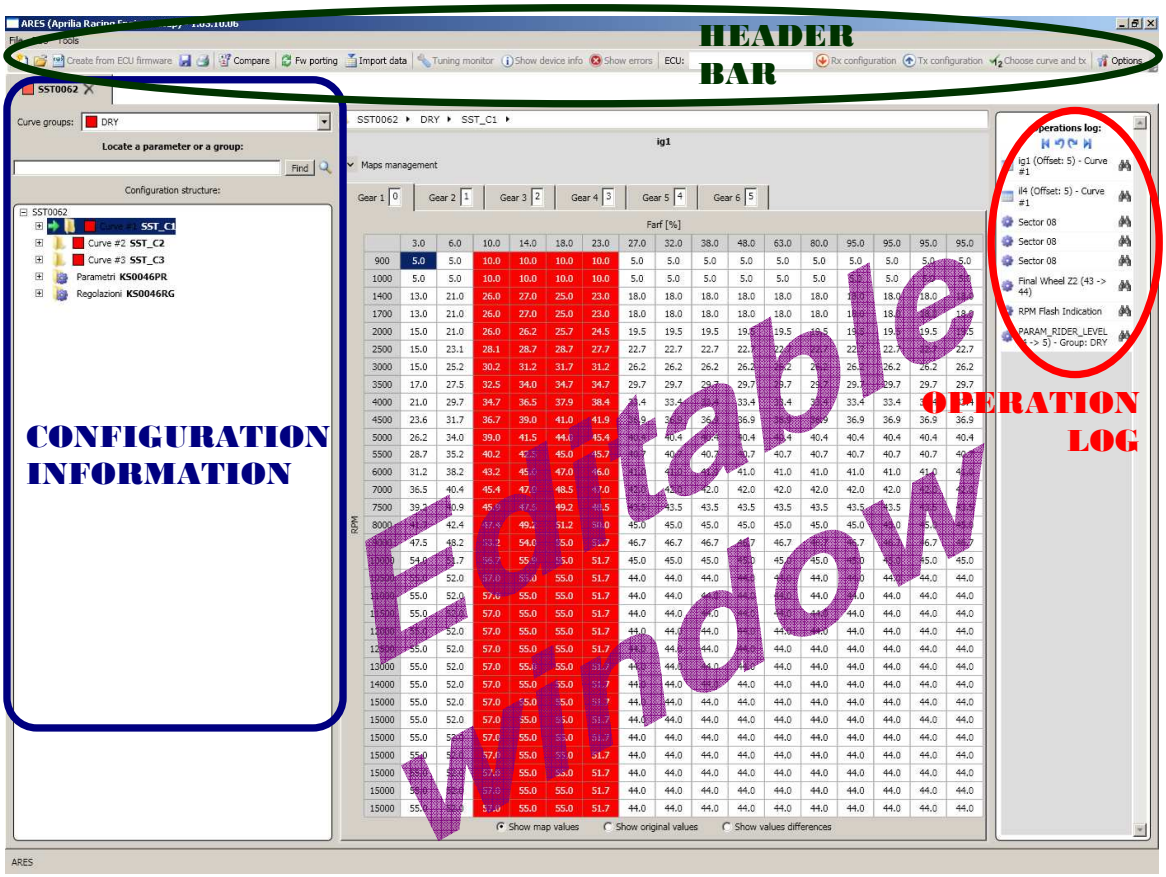
Tuning Adjustments: group of characteristics of the engine (and some of the chassis) that can be modify and set by the user.

A ***configuration*** includes all the previous characteristics (curves, parameters and adjustments). The configuration is transmitted to the ECU for a proper operation of motorbike in general and particularly of the engine.

↳Depending on the firmware of the configuration there are different parameters and tuning adjustments to modify.

☑In order to know more about available parameters and tuning adjustments go to the document: ***ARES* Engine Configuration Setup**, *User's guide* and its ***corresponding Engine Configuration Version*** .

1.2. Principal ARES screen

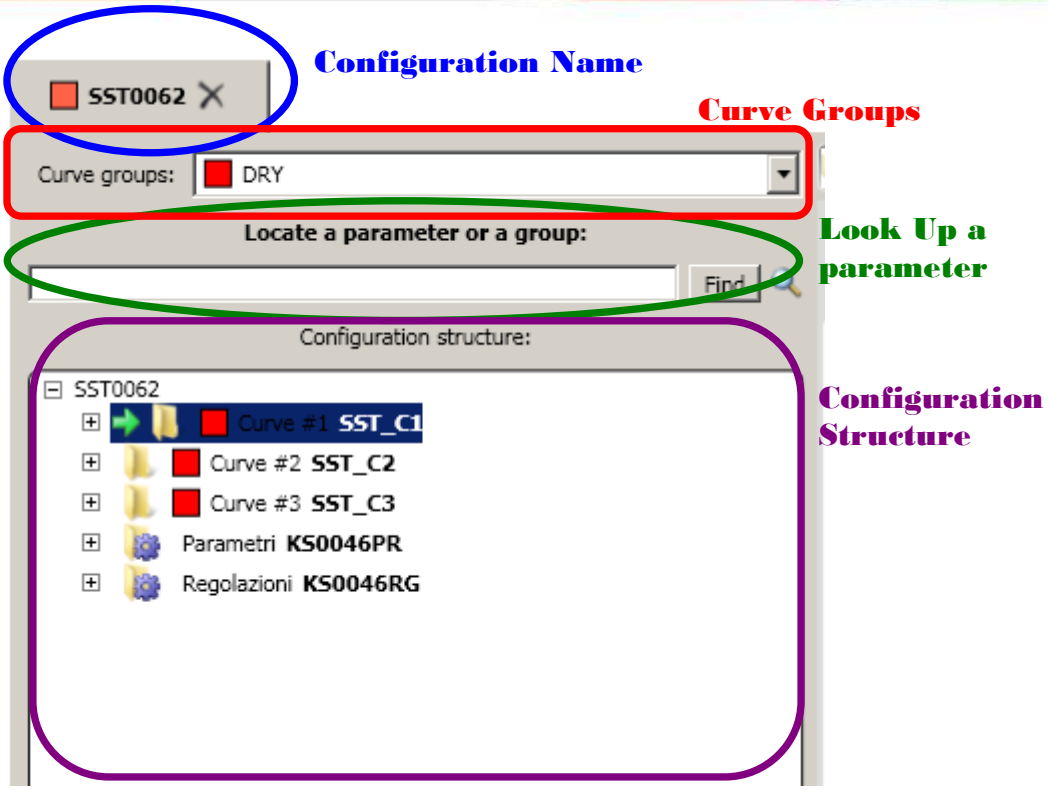


1. Header Bar

On the top of the screen is placed the header bar with the Main menu and the toolbar.

2. Configuration Information

This part of the screen shows information about the opened configurations.



A. **Configuration name:** It shows the name of the configuration. There is as many tab as open configuration. Each tab contain the configuration name.

B. **Curve Groups:** Shows the created curve groups.

C. **Look up a parameter:** to look up a parameter, curve, tuning adjustment or value by writing the name in the text box.

D. **Configuration structure:** Shows the tree structure of the opened configuration.

3. Editable window

All parameters, tuning adjustments and curve values are modified within this window. By selecting the configuration variable that is to be modified the appropriate window will be displayed.

4. Operation Log

This table shows all the all the modifications of the configuration in a chronological order.

Chapter 2. How to open an engine configuration

When you open ARES, you first need to load a configuration in order to work. The configuration is associated with a firmware. This can be done in the different ways:

- directly from the ECU,
- from the Ares configuration database,
- or from a file.

The opened configuration will be showed at the left of the screen.

It is possible to open several configurations at the same time. The user may see all the opened configurations in the tabs at the top left of the screen. The highlighted box indicates the active configuration.

2. 1. Configuration from the ECU

When the ECU *is connected* to the PC, it is possible to ***receive*** the configuration from the ECU. Just click on the "*Rx configuration*" button

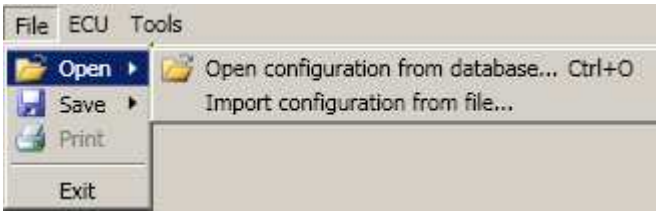
and the configuration will be showed automatically in the screen.

The configuration from the ECU These already has an associated firmware.

See section 5.1 Transmit and Receive for further information.

2. 2. Opening An existing configuration

It is possible to open an existing configuration. Click on the option "*File*" in the header bar and then "*Open".*

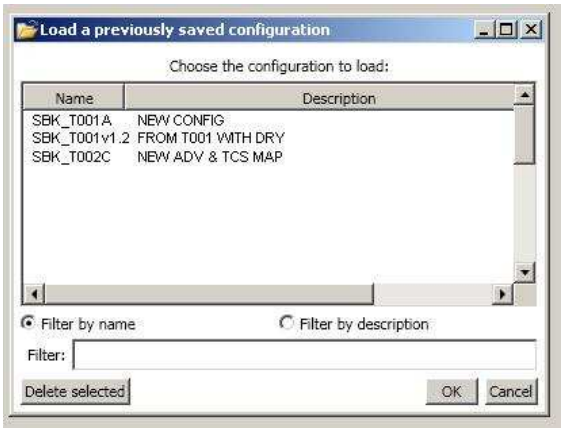


There are <u>*two ways*</u> to open an existing configuration. These configurations already have an associated firmware.

1. ***Open configuration from database*** **:** the user chooses a configuration that has been saved before in the Ares database.

   Click on the "*Open configuration from data base*" option or via the shortcut <Ctrl+O> or the icon .

   Next window shows the configurations in the database. Select one configuration and then click on the "Ok" button to load it in the screen.



   - There are search filters to simplify the process of selecting configuration.

Just write the word to filter in the text box "*Filter:"* and then choose the criteria:

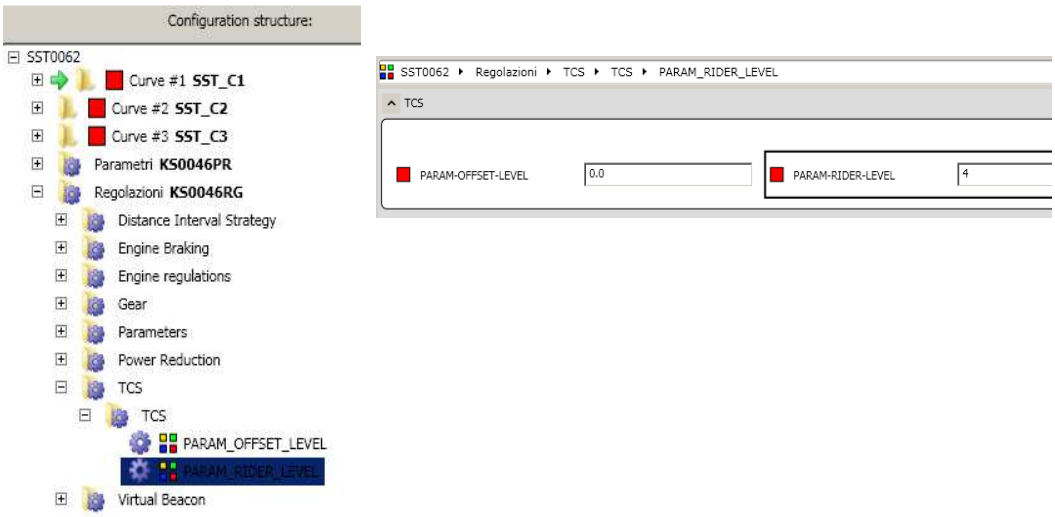
- Filter by name.
- Filter by description.

2. ***Import configuration from file:*** this configuration is not saved in the database, therefore the user must import it from a file (*.aec). Click on the "*Import configuration from file*" option and then search the desired file in the "Open" window.

Chapter 3. How to Modify a Configuration

Depending on the firmware configuration version, an engine configuration has different parameters and tuning adjustments that may be modified.

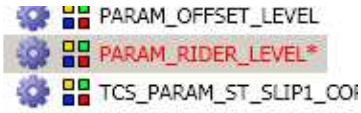
All configuration values are modified and visualized within the “editable window”. By selecting the configuration variable that is to be modified the appropriate window will be displayed.



When a parameter or tuning adjustment is modified:

- a red frame will highlight the modification.

- the colour of the parameter in the configuration structure will become red.



- and the modification is saved in a table “*Operations log*”.

3. 1. Operation Log

Operations log: This table is a list which shows all the modifications of the configuration. They are listed in chronological order (last modification is the last in the list).

By clicking on the icon the software shows the corresponding parameter on screen.

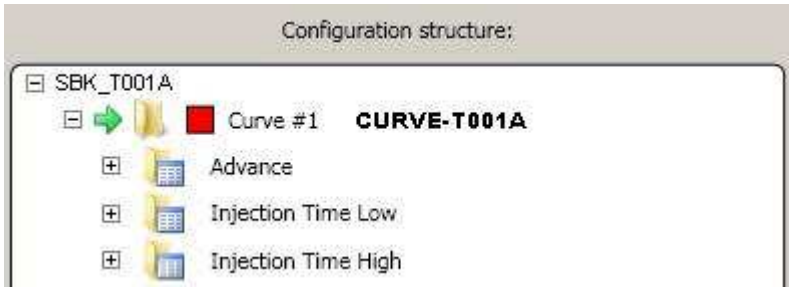
In order to undo the last modification just click on it, it will become highlighted and return to its previous value. It is possible to undo all modifications but always in reverse chronological order.

In the same way it is possible to redo the last cancelled modification and all the cancelled modifications (in the same order).

The following explanation shows in detail how to modify parameters or tuning adjustments.

3. 2. Curves

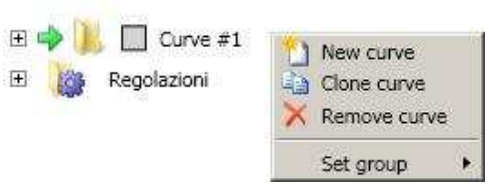
This option allows the user to change engine mapping curves. An example of a structure for the “Curve” option is:



In order to know more about available curves and how to manage them go to the corresponding “*Configuration Set Up*” user’s manual; *1.1. Curves* section.

3. 2. A. Add and Manage curves

It is possible to add other curve structures in the same configuration and manage them by clicking with the right mouse button in the “*Curve*” field.



New curve: the added curve will set all map values to zero.

Clone curve: added curve will have the same maps than the original one.

Set group: In order to administer the *groups*. (Detailed explanation below)

☑ The icon indicates which curve is being modify.

☑ The number of curves will be restricted by the firmware configuration version.

3. 2. B. Groups

Groups: it is possible to divide curves into groups and associate different parameters and tuning adjustments values to each group. These groups will be created and controlled by the user (name, features…). Click on the right button in the "Curve" field and then "*Set group ⇒ Edit groups…*"

o Click the "New" button to add new groups. It is possible to set the colour and the name for each group. In order to cancel any group check the corresponding box and then click on the "Remove" button.

Once the groups have been created each curve may be associated to the desired group. Click the right mouse button in the "*curve*" field of the configuration structure, then click on the desired group.

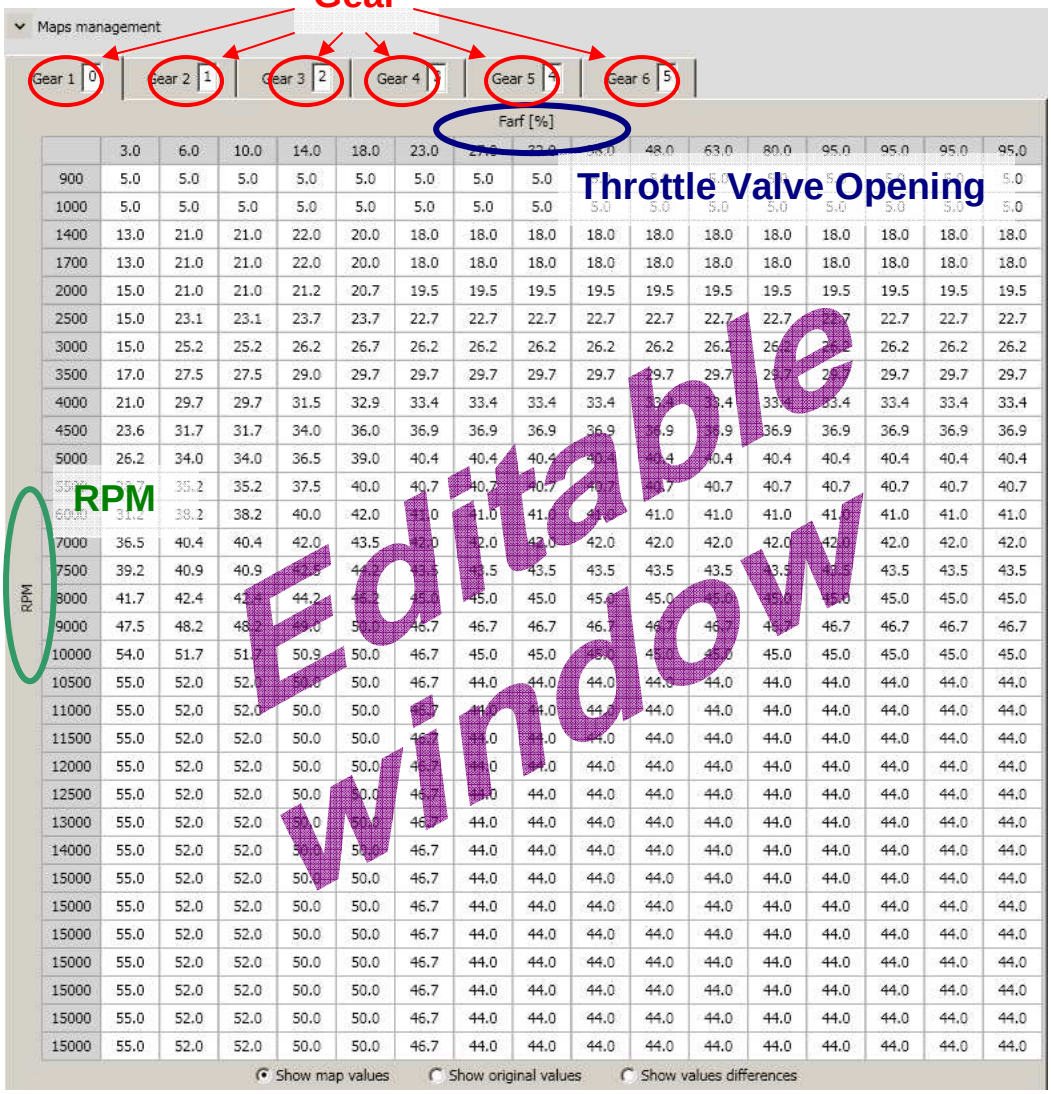
☑ It is possible to create, at least, as many groups as existing curves.

☑ All parameters that may be associated with a group will be marked with the icon.

☑ In the corresponding "Configuration *Set Up*" user's manual" is explained which parameters depend on the associated group.

3. 2. C. Table Map

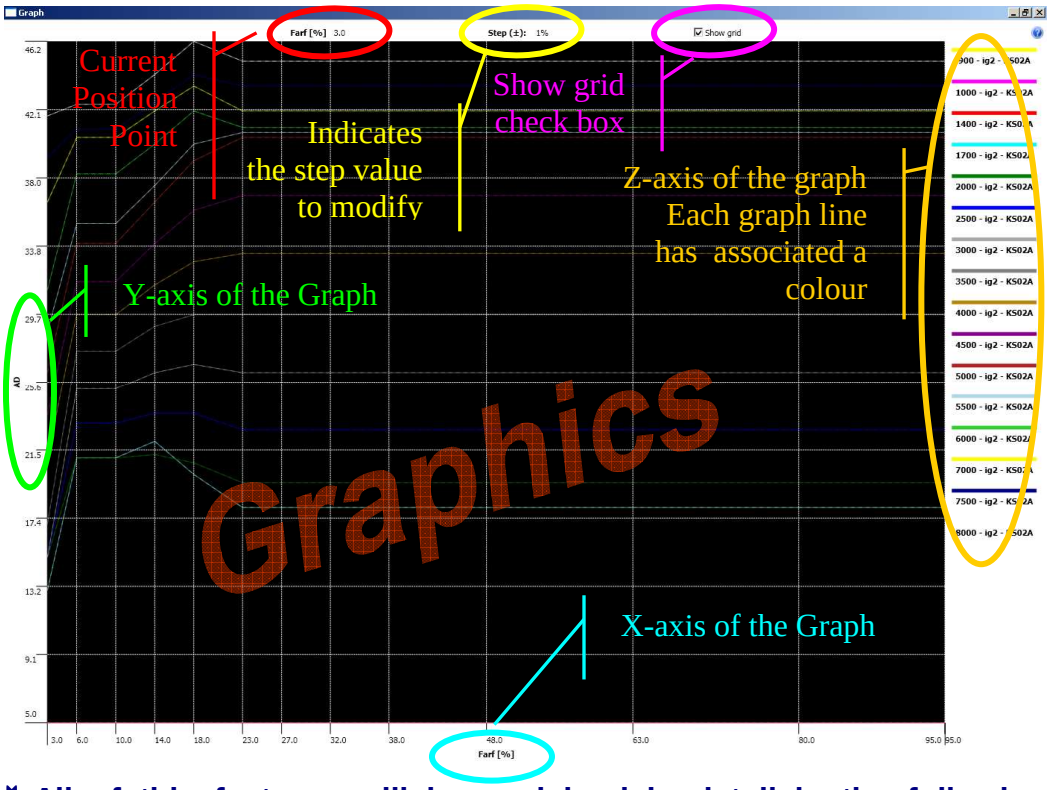
The table of each map is a 3-axis function. Where the X-axis refers to the throttle valve opening (in percent) *["Farf" in Fig.]*, the Y-axis refers to the RPM value, and the Z-axis refers to the gear. As shown below:



RPM	3.0	6.0	10.0	14.0	18.0	23.0	28.0	33.0	48.0	63.0	80.0	95.0	95.0	95.0	95.0
900	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1400	13.0	21.0	21.0	22.0	20.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
1700	13.0	21.0	21.0	22.0	20.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
2000	15.0	21.0	21.0	21.2	20.7	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5
2500	15.0	23.1	23.1	23.7	23.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
3000	15.0	25.2	25.2	26.2	26.7	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2
3500	17.0	27.5	27.5	29.0	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7
4000	21.0	29.7	29.7	31.5	32.9	33.4	33.4	33.4	33.4	33.4	33.4	33.4	33.4	33.4	33.4
4500	23.6	31.7	31.7	34.0	36.0	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9
5000	26.2	34.0	34.0	36.5	39.0	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4
5500	28.7	35.2	35.2	37.5	40.0	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7
6000	31.2	38.2	38.2	40.0	42.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0
7000	36.5	40.4	40.4	42.0	43.5	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
7500	39.2	40.9	40.9	41.5	44.2	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5
8000	41.7	42.4	42.4	43.2	46.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
9000	47.5	48.2	48.2	49.0	50.0	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7
10000	54.0	51.7	51.7	50.9	50.0	46.7	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
10500	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
11000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
11500	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
12000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
12500	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
13000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
14000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
15000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
15000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
15000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
15000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
15000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
15000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
15000	55.0	52.0	52.0	50.0	50.0	46.7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0

3. 2. D. Graph

It is also possible to display the map values (advance or ignition) in a graph. The typical graph window is showed next:

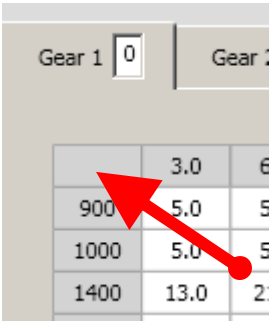


↳All of this features will be explained in detail in the following section: Modify values; graph mode.

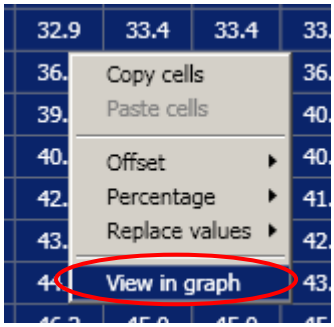
There are different ways to graph the map values:

1. ***display the complete table in a graph***:

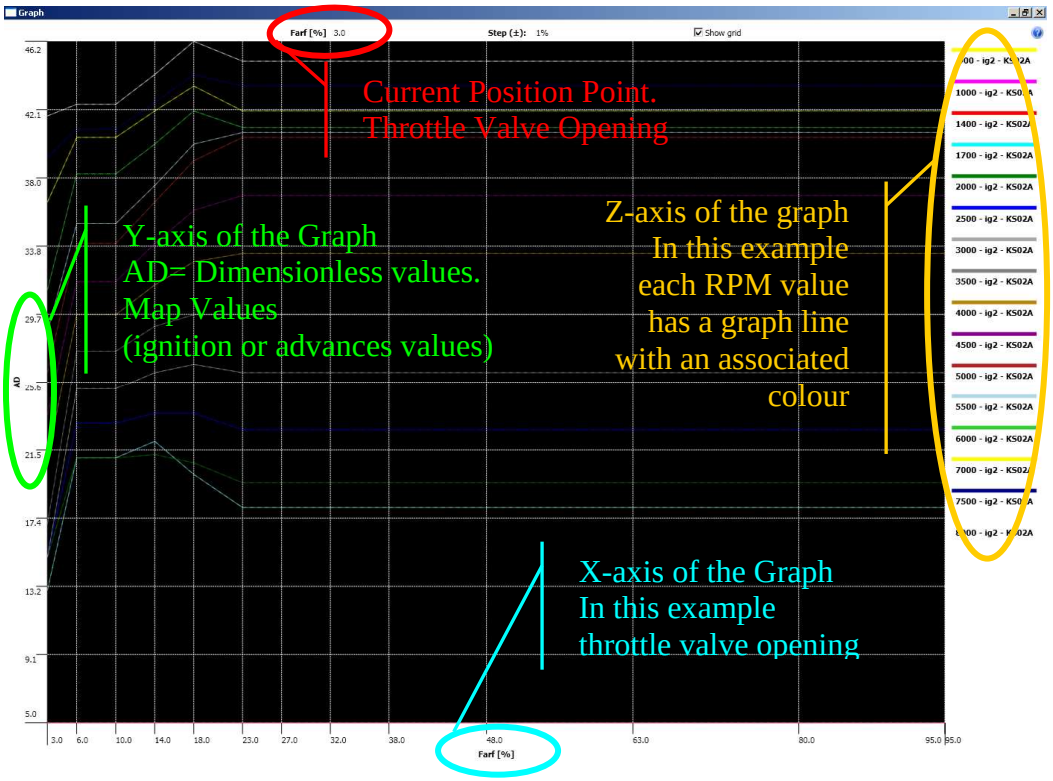
   Select all the maps values by clicking on the cell of the upper left corner:



All the cells become highlighted blue. Then click on the right mouse button and select the "*view in graph*" option:



This option opens the graph window. This graph represents the map values (ignition or advances values) (in the Y-axis) as a function of the throttle valve opening (in the X-axis) for each RPM value. This graph window has the following characteristics:



2. display selected cells in a graph:

It is possible to graph only the desired throttle valve *opening* columns or *rpm* rows.

a. Graph the map values as a function of the RPM

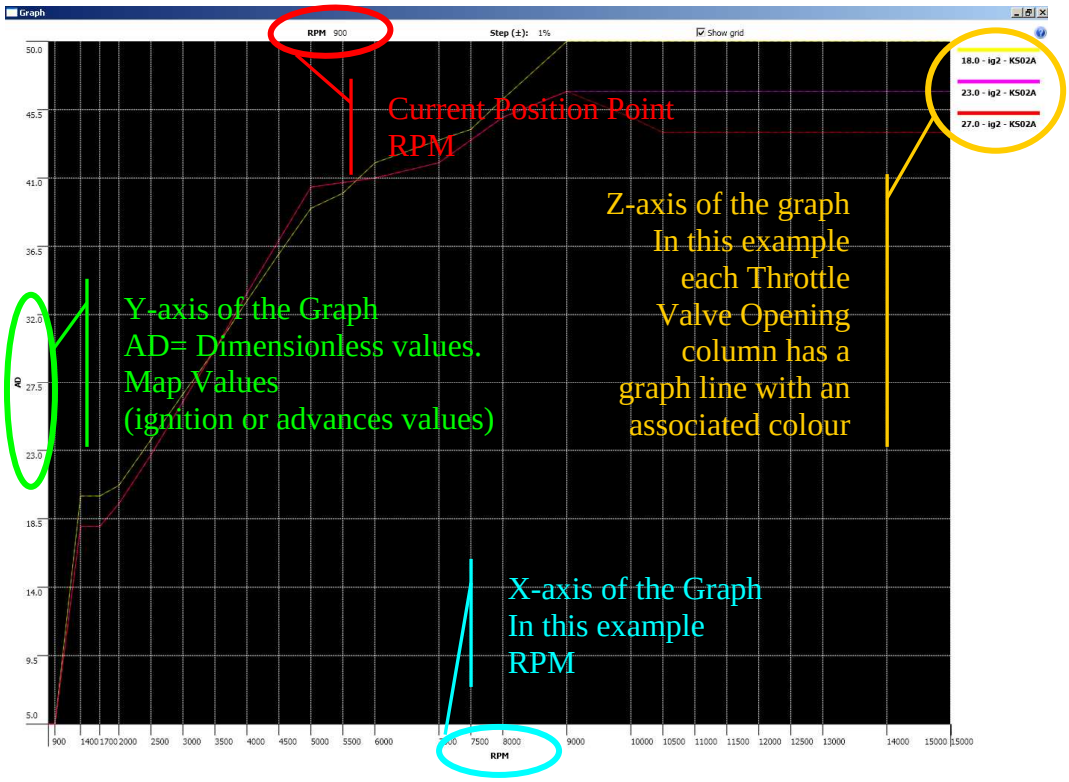
In order to graph the maps values as a function of the RPM just select the desire throttle valve opening columns.

Click on the desired throttle valve openings column leader. In order to select more than one column hold clicked the left mouse button and select the desired throttle valve opening column leaders.

				Farf [%]
14.0	18.0	23.0	27	32.0
5.0	5.0	5.0	5.0	
5.0	5.0	5.0	5.0	5.0
22.0	20.0	18.0	18.0	18.0
22.0	20.0	18.0	18.0	18.0
21.2	20.7	19.5	19.5	19.5
23.7	23.7	22.7	22.7	22.7
26.2	26.7	26.2	26.2	26.2
29.0	29.7	29.7	29.7	29.7
31.5	32.9	33.4	33.4	33.4
34.0	36.0	36.9	36.9	36.9
36.5	39.0	40.4	40.4	40.4
37.5	40.0	40.7	40.7	40.7
40.0	42.0	41.0	41.0	41.0
42.0	43.5	42.0	42.0	42.0
42.5	44.2	43.5	43.5	43.5

All the selected cells become highlighted blue. Then click on the right mouse button and select the "*view in graph*" option.

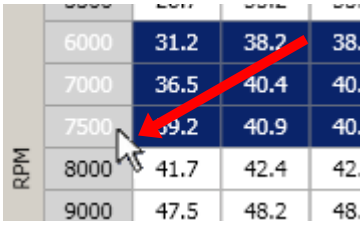
This graph represents the map values (ignition or advances values) (in the Y-axis) as a function of the RPM (in the X-axis) for each selected throttle valve opening value.



b. Graph the map values as a function of percentage of throttle valve opening

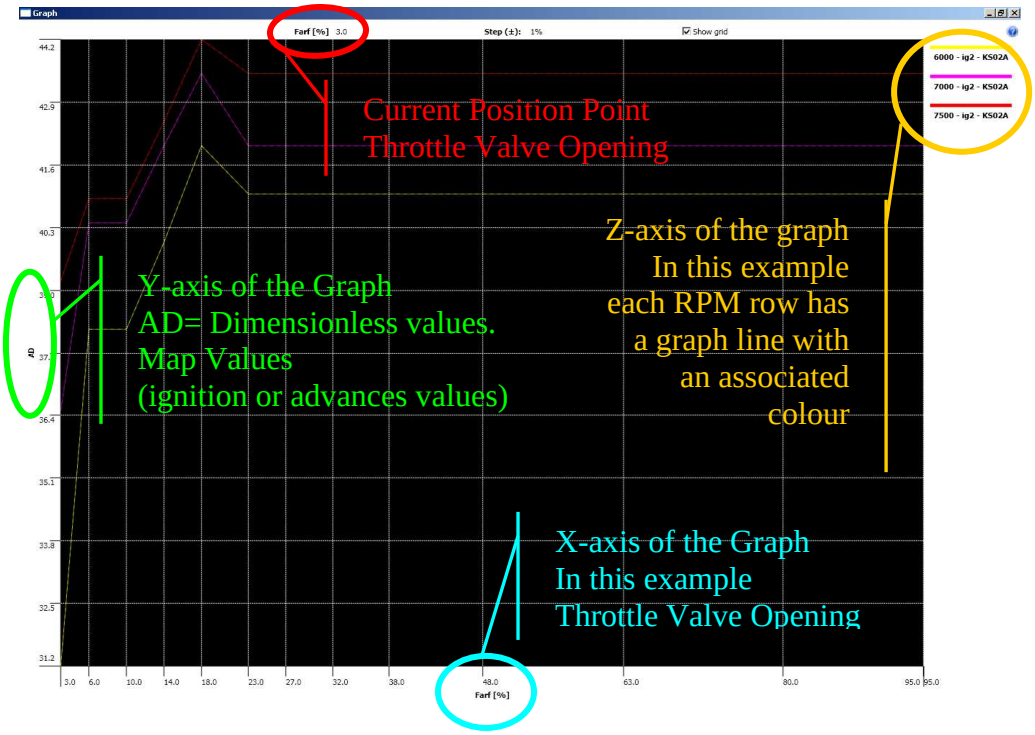
In order to graph the maps values as a function of percentage of throttle valve opening just select the desired RPM rows.

Click on the desired RPM row leader. In order to select more than one row hold clicked the left mouse button and select the desired RPM row leaders.



All the selected cells become highlighted blue. Then click on the right mouse button and select the "*view in graph*" option.

This graph represents the map values (ignition or advances values) (in the Y-axis) as a function of the throttle valve opening (in the X-axis) for each RPM selected value.



3. 2. E. Modifying values

It is possible to modify map values in the table or in the graph. All the modifications will be listed in the "Operation Log" table.

1. **Modify map values in the *table* mode**

Select the cell or cells to modify in the table. The selected cells become highlighted blue. By clicking the right mouse button next options are available.

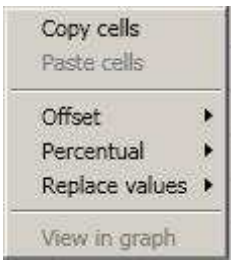
Copy cells: copy the selected cells of the table.

Paste cells: paste de copied cells in the table.

Offset: Adds the written value to the original one.

Percentage: Adds this percentage of the original value.

Replace value: Just replaces the original value with the new one.



↳The modified cells become highlighted red.

↳ ***Copy cells & Paste cells options:*** **Allow also the user to use a spreadsheet (for example Excel) as a working tool. It is possible to copy cells from any map, modify them in the spreadsheet program and then paste them in the desired cells of the original map.**

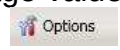
Visualization mode:

At the bottom of the screen, below the table, there are three visualization option:

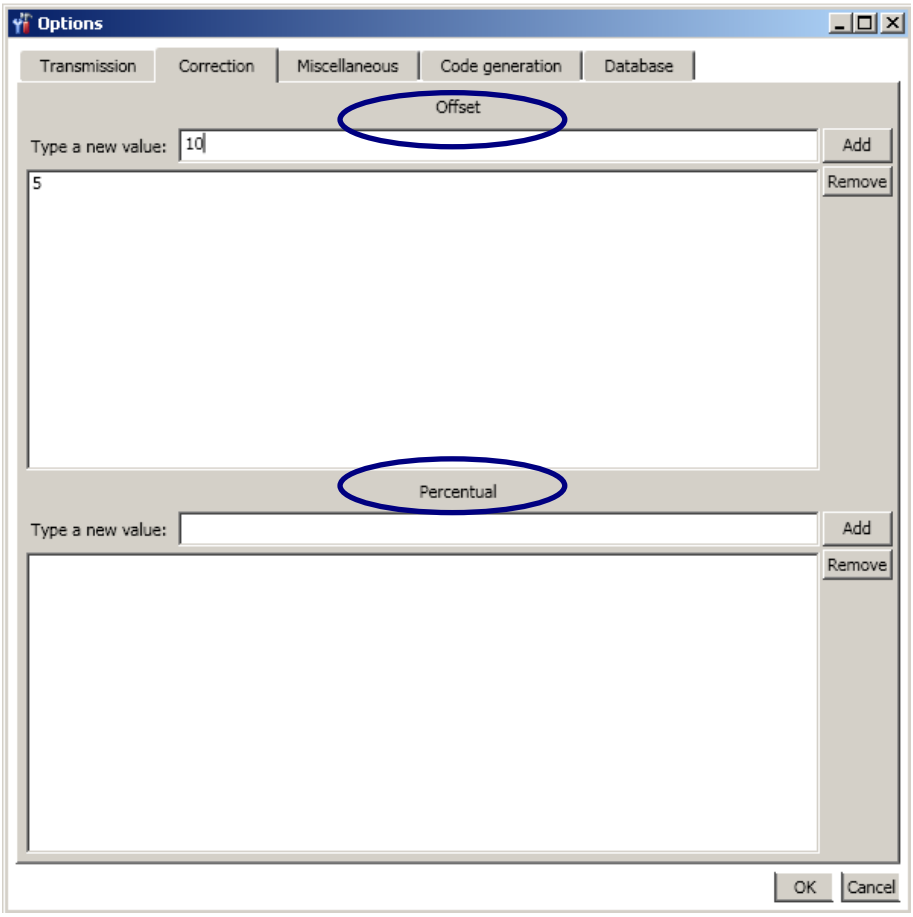
- ***Show map values:*** the default option, where the user works. It shows the actual value of each cell.
- ***Show original values:*** original values, before being changed.
- ***Show values differences:*** show the differences between map values and original values for each cell

↳**With all three options the modified cells remain highlighted.**

Set a fast correction value:

It is possible to personalize the offset and percentage values in order to modify values quickly. Click on "*options*" button 

and then click on the "*correction*" tab:

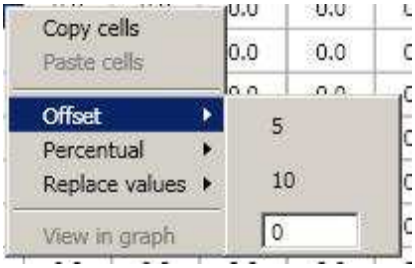


This tab allows the users to administer personal values.

In order to **add** a new correction just write the *offset* or *percentage* value in the corresponding box text and then click on the “Add” button.

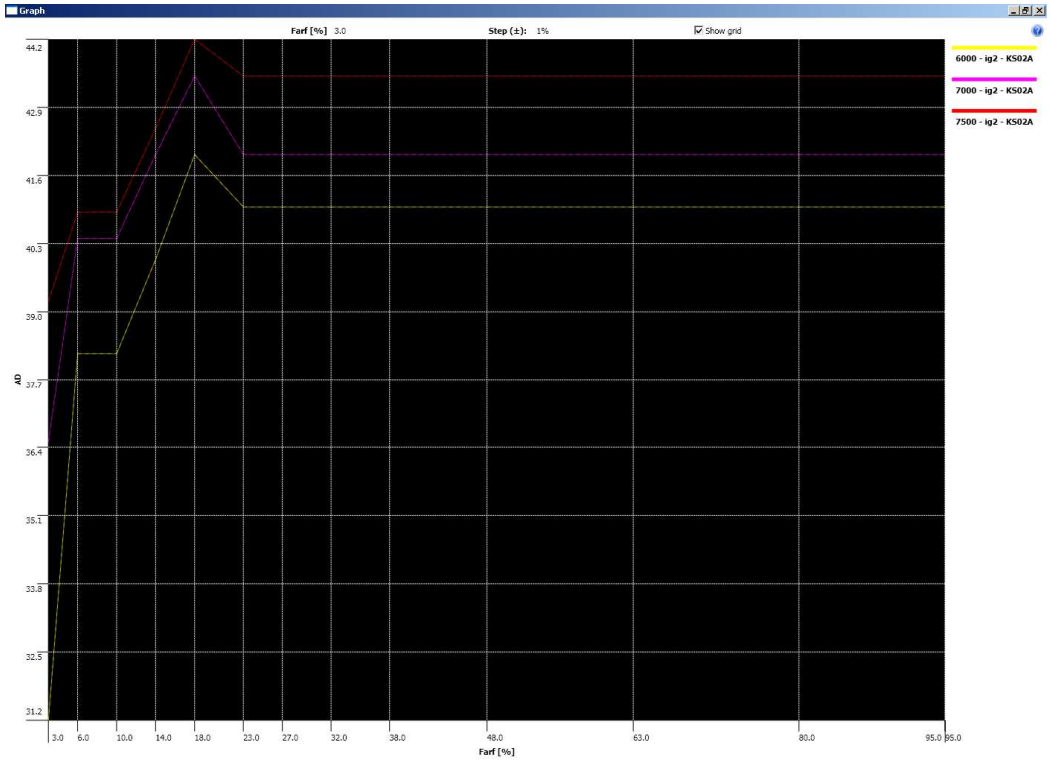
To **cancel** a correction just select this correction and then click on the “Remove” button.

In every table map, all values added will be available when clicking on the cell with the right mouse button:



2. Modify map values in the ***graph*** mode

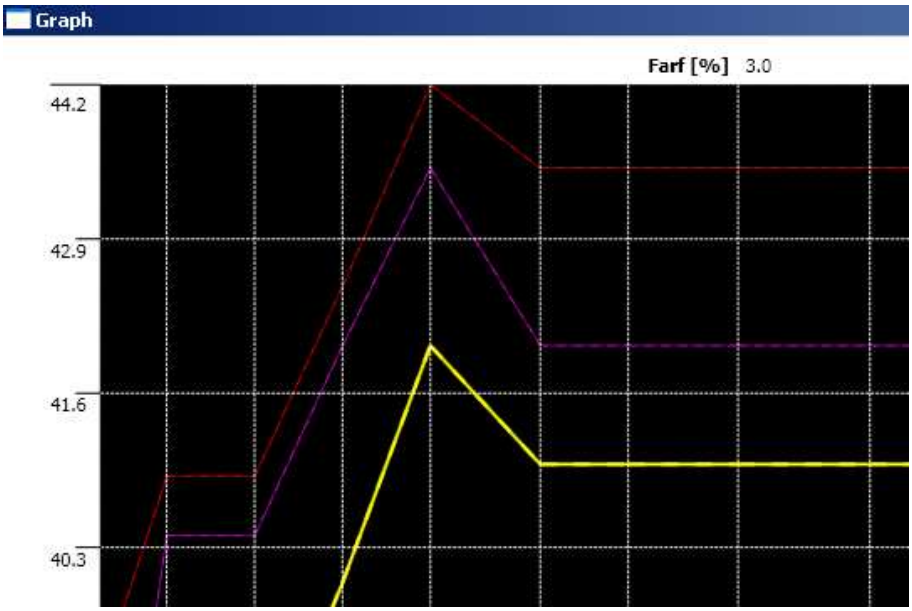
The original graph is the following:



It is graphed three RPM rows as a function of the throttle valve opening. The table in the top right of the screen has information for each graph line.

	RPM:	***Map Advance***	***Map name***
6000 - ig2 - KS02A	6000		
7000 - ig2 - KS02A	7000	Ig2	KS02A
7500 - ig2 - KS02A	7500		

In order to select a graph line press the “tab” key.



In order to move the select point press the left or right arrow.

To increase or decrease the advance value just use the up and down arrows respectively.

The Dash lines represents the original graphic before the modification. Solid lines represents the current graphic after the modification.

The parameters at the top of the window show:

Farf[% (or RPM]): shows the current X-axis position point.

Step (±): indicates how is the step to modify. (*Page Up and Page Down*).

The table in the top right of the screen shows information about the current and the original values and the difference.

6000 - ig2 - KS02A	
Current:	40.7
Original:	42.0
Difference:	-1.3

↳By positioning the cursor on the help button top right (*do not click*) a brief help keyboard menu opens.

Tab	Choose the curve
Pag up	Increase the step
Pag down	Decrease the step
Left arrow	Move the selected point left
Right arrow	Move the selected point right
Up arrow	Increase the value of the selected point
Down arrow	Decrease the value of the selected point

3. 3. Parameters (parametri)

As it has been explained before the parameter option includes a group of internal parameters to set the starting point of the engine.

↳Depending on the firmware of the configuration there are different parameters to modify. Usually the parameters will be only for staff Aprilia.

☑In order to know more about available parameters go to the document: ***ARES* Engine Configuration Setup**, *User's guide* and its ***corresponding Engine Configuration Version***.

3. 4. Tuning Adjustments (*regolazioni*)

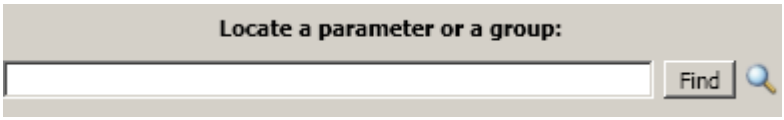
The tuning adjustment is a group or characteristics of the engine (and some of the chassis) that can be modify and set by the user. The tuning adjustment option includes all the parameters that may be change with the Palm Terminal. Therefore, these parameters depend on the firmware configuration associated with the configuration.

↳Depending on the firmware of the configuration there are different tuning adjustments to modify.

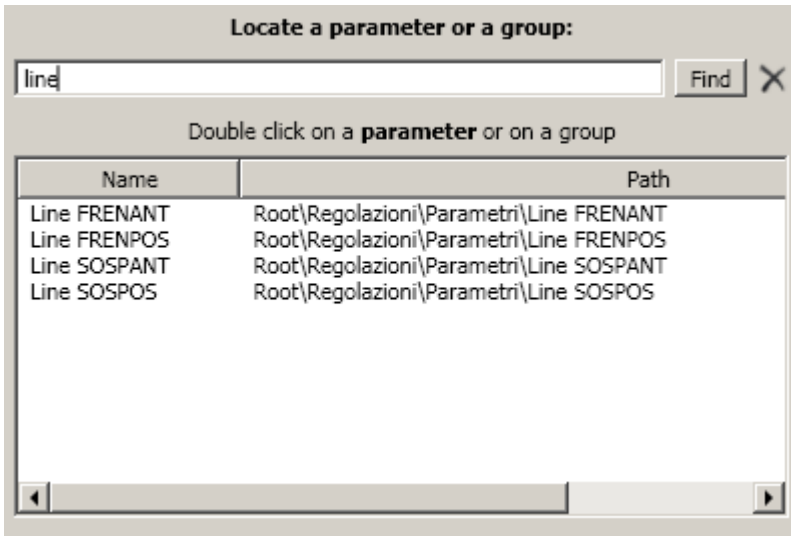
☑In order to know more about available tuning adjustments go to the document: ***ARES* Engine Configuration Setup**, *User's guide* and its ***corresponding Engine Configuration Version***.

3. 5. Find a parameter or adjustment

On the left hand side of the screen is situated the "***locate***" function. This function allows the user to search for a desired parameter or tuning adjustment by writing its name.



All found matches will be listed in the table below.



Double click to select it and visualize it. In order to open and close this list click on and , respectively.

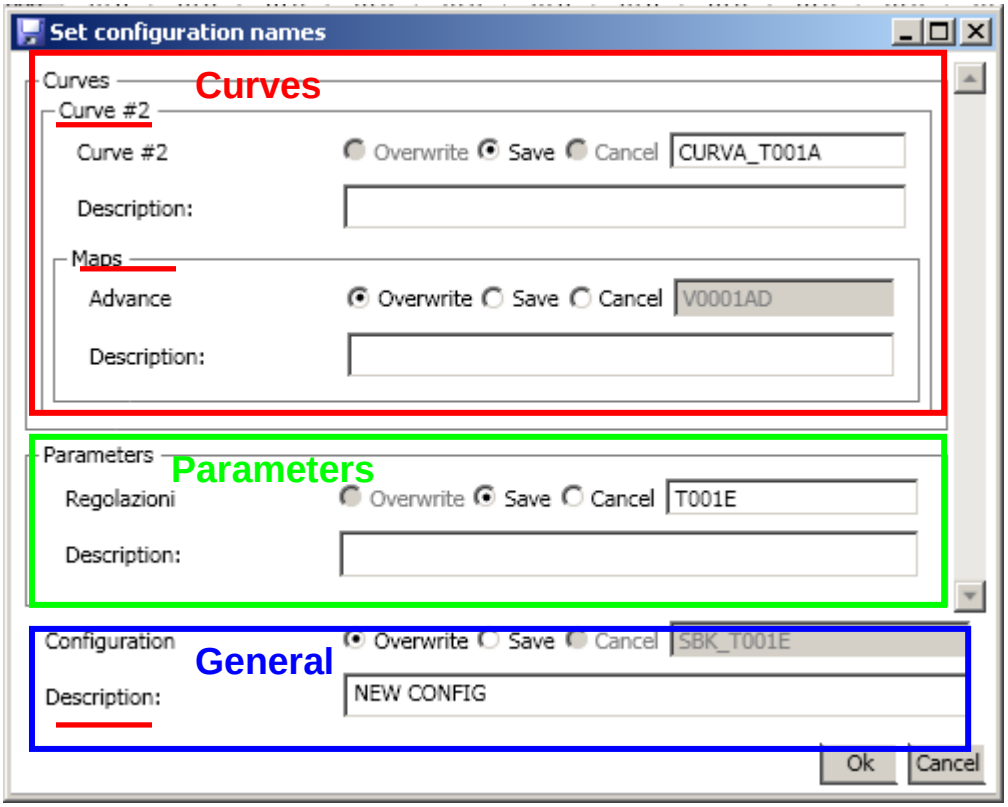
By clicking on the "*Find*" box the program will select the first parameter or tuning adjustment of the "*configuration structure*".

Chapter 4. Saving the new configuration

The next two options are available by clicking the “File” option in the main Toolbar and then “Save”:

4. 1. Save configuration to database

Before transmitting a configuration to the ECU it is recommended to save this configuration to database. Click on the “Save configuration to the database” option or use the shortcut <Ctrl+S> or the icon . A similar window appears:



4. 1. A. Sections of the "Set configuration names" window

All modifications are divided into groups like the main configuration structure is organized.

- *Curves*
- *Parameters* → Tuning adjustments (*regolazioni*).
- *General*

A. Curves

Within this section there is a sub-section for each group of curves that has been modified (curve #1, curve #2,etc…).

Within the subsection "*Curve#* " the subsection *Maps* indicates which maps have been modified:

- Advance
- Injection Time Low
- Injection Time High

B. Parameters

This section appears if you have modified one or more parameters in the tuning adjustments option.

C. General

This section refers the whole configuration.

4. 1. B. How to save the configuration

At this stage the user should confirm the modifications completed during the session.

There are three radio button options:

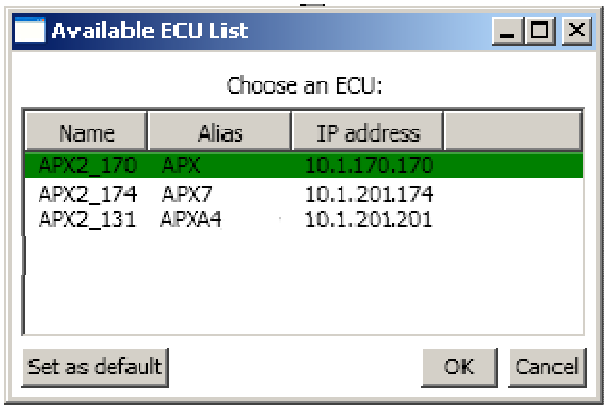
1. ***Overwrite:*** save with the same name but losing the previous one.
2. ***Save:*** Is like the “save as…” option. This option saves modifications or new configuration in the database, without losing the previous ones.
3. ***Cancel:*** this option cancels only the selected section. For example, in the previous figure, by checking cancel in the *Regolazioni* (tuning adjustment) section only these modifications will not be saved.

4. 2. Export configuration to file

This option save the configuration in a folder. Click the “File” option in the main Toolbar and then “Save”. Click on the “Export configuration to file option. This option also allows the user to export the configuration from one computer by saving a single file in order to use it in another computer.

Chapter 5. Functions when ECU and PC are connected

When the ECU is connected to the PC by clicking on the ECU: ECU: APX2_170 text box all the available ECU's connected will be visible in the next window.



☑ **It is necessary to set a ECU as default the first time that the user clicks on the *ECU:* text box:**

Select the desired ECU and then the *"Set as default"* button.

☑ **When an ECU is *set as default*, if you try to select one of the other ECU's (not the default one) the software will ask for a confirmation.**

Once the ECU is connected the following option will be available:

5. 1. Receive

If the ECU is connected, it is possible to ***receive*** the configuration from the selected ECU. Click on the ECU option and then "Rx configuration" in the Main Toolbar. Or click the Rx configuration icon.

The received configuration will be showed automatically.

The active curve will be showed with the icon.

5. 2. Transmit

In order to ***transmit*** a configuration from a PC to the selected ECU, in addition to being connected, the ECU configuration firmware must be compatible with the firmware configuration that is to be transmitted.

The firmware compatibility is indicated, when the ECU is connected, in the tab of the configuration, by the colour of the square.

– If the ***square colour is green:*** Compatible firmware configuration. The configuration may be transmitted to the ECU correctly.

– If the ***square colour is red:*** Not compatible firmware. It is not possible to transmit the configuration. It is necessary to update the firmware configuration to transmit.

↳See section *6.2 Fw porting* for more information about how to update the firmware configuration.

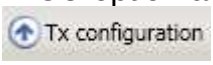
It is possible to transmit the configuration to the ECU in two ways:

- ***Tx configuration***; transmit the same active curve .
- ***Choose configuration to tx***: choose the active curve to transmit

5. 2. A. Tx configuration

This option transmits to the ECU the same active curve that it was being used before receiving.

For example, in the ECU the active curve is the *curve #1 SST_C1*. Then the configuration is received in the PC and it is modify. By using the "Tx configuration" option to transmit the configuration to the ECU, the active curve will be the *curve #1SST_C1*. Also if the other curves have been modify.

Click on the ECU option and then "Tx configuration" in the Main Toolbar. Or click the 

icon.

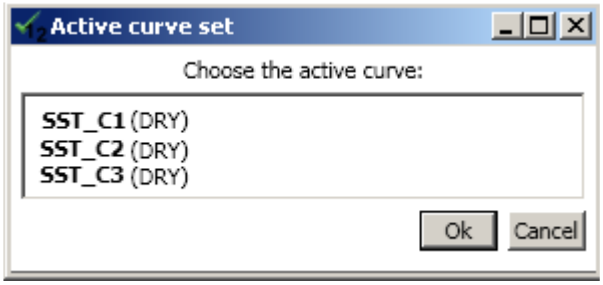
5. 2. B. Choose configuration to tx

Use this option to change the active curve to transmit to the ECU.

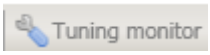
Click on the "Tools" option in the header menu and the Choose configuration option. Or just click on the

icon in the toolbar.

In this window appears all the curves of the configuration with its group. Select the curve to transmit and click "Ok" button to transmit the configuration.



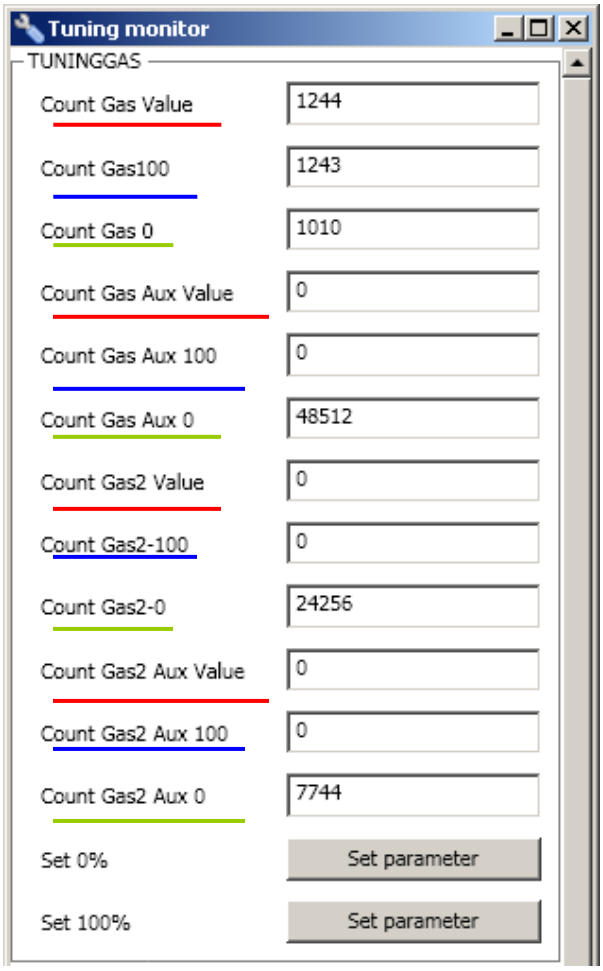
5. 3. Tuning monitor

With the PC connected with the ECU, it is possible to see several tuning operations. Click on ECU in the header bar and the Tuning monitor option, or just click on the 

button in the toolbar.

5. 3. A. Gas tuning

- In order to set the closed throttle position:
  1. *Leave at rest the twist grip.*
  2. *Click on set 0% “Set parameter” button.*
- In order to set the full throttle position:
  1. *Rotate the twist grip to full throttle.*
  2. *Click on set 100% “Set parameter” button.*



Count Gas __ Value:
Real Time Count Value

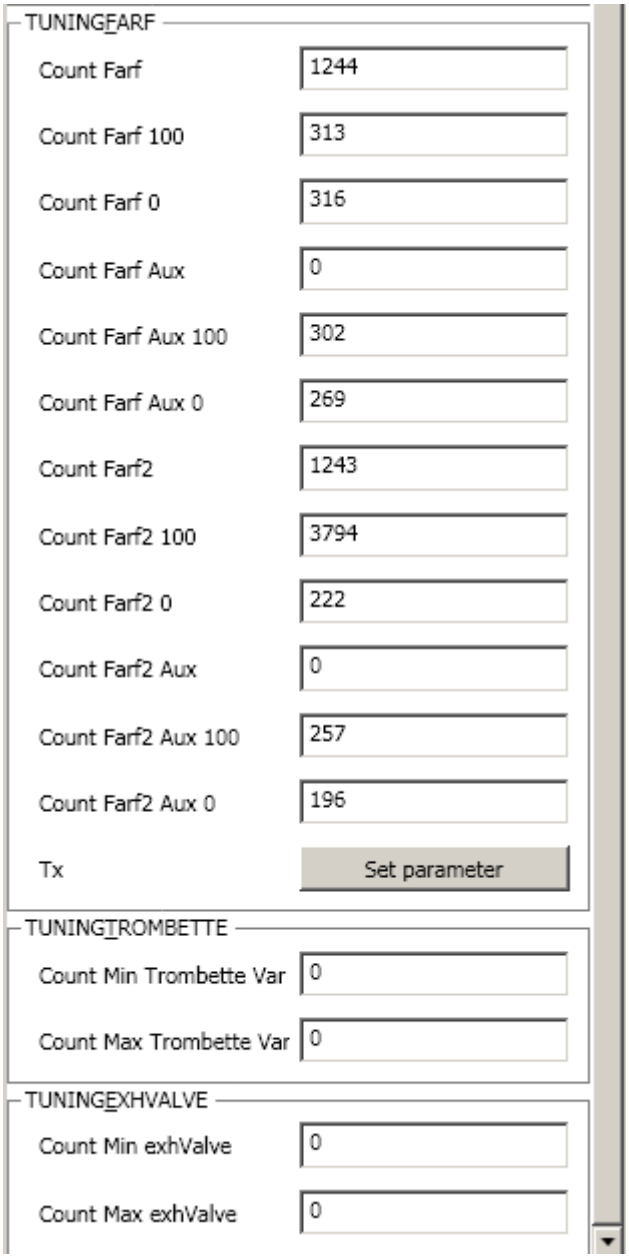
Count Gas __ 100:
count values when 100% throttle position

Count Gas __ 0:
count values when 0% throttle position

5. 3. B. Throttle valves, Air trumpet valves, Exhaust valves tuning.

In order to do the tuning of these valves just click on the Tx "*Set Parameter*" button.

Air trumpet valves and exhaust valves are parameters not available to set for SST category.



Count Farf __ :
Real Time Count Value

Count Farf __ 100:
count values when 100% throttle position

Count Farf __ 0:
count values when 0% throttle position

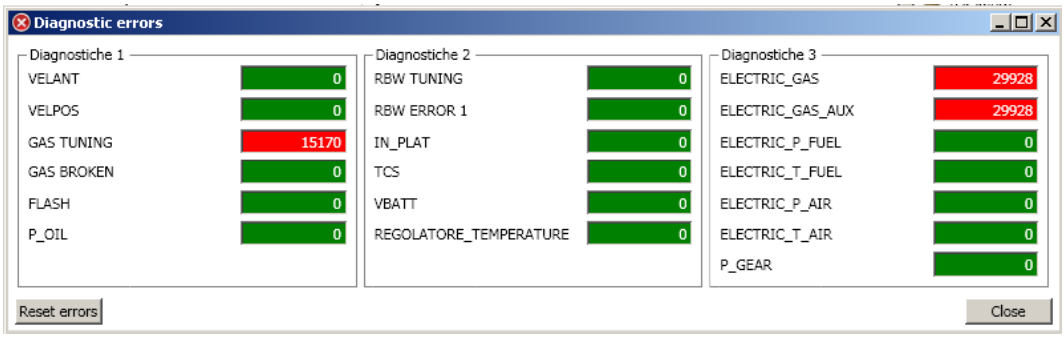
- **SST categories has four throttle potentiometers: Gas, Gas Aux, Gas2 and Gas2 Aux.**
- **However SBK categories has only two: Gas and Gas Aux. Other values (gas2 and gas2aux) will remain disabled in the SBK configuration.**

5. 4. Show device info

This option displays all information of the connected ECU.

5. 5. Show errors

By clicking on this button it is possible to see a list of all sensors that may be faulty.



These signals are divided into groups.

The signals that are green have no error.

The signals that are red are faulty.

The number indicates how many errors.

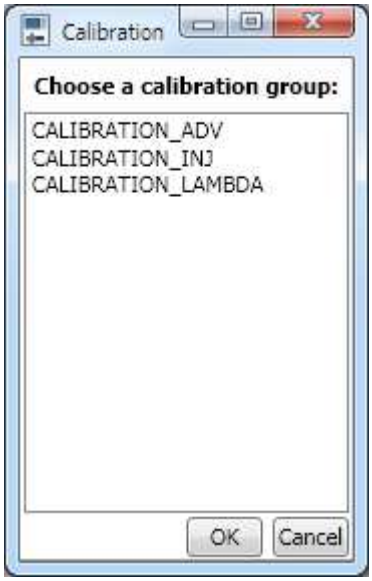
- If the number is fixed means that there had been an error but not at that moment.
- However if the number is increasing means that the error still exists.

If after clicking on the "*reset errors*" button the errors persist (still red) goes to check the sensor or the calibration.

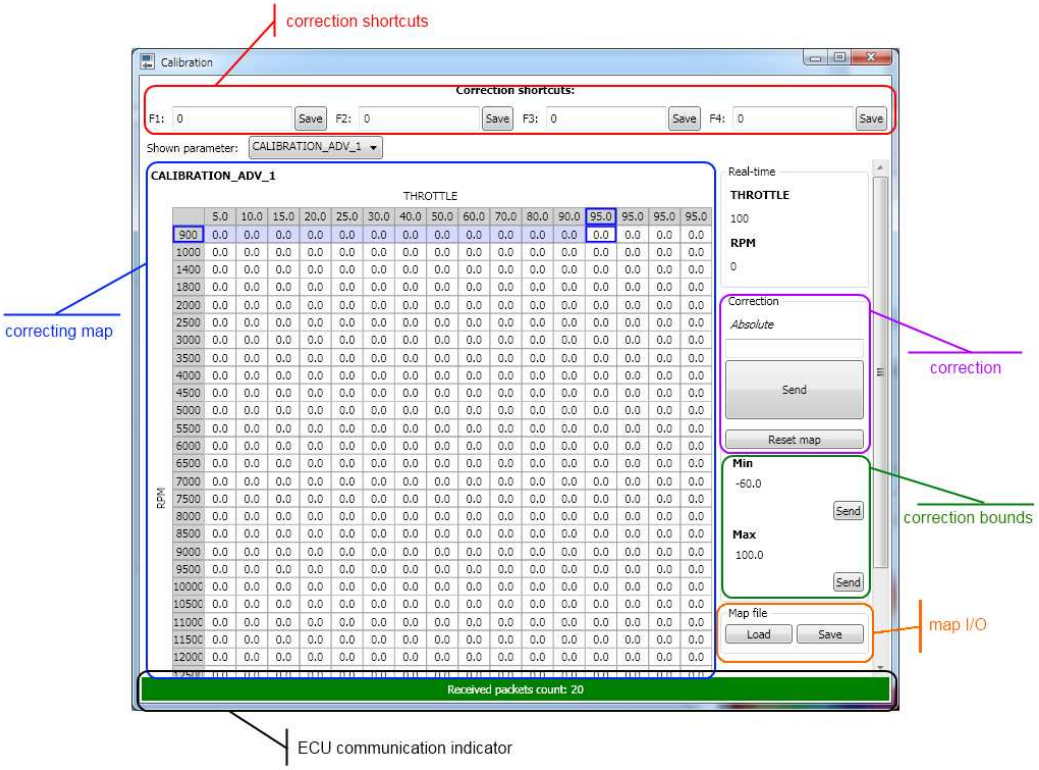
5. 6. Show calibration

By clicking on this button it is possible to open the calibration window, used to adjust advance and injection maps values, and to see as auto-lambda works when it's running.

First of all, you have to choose which to calibrate:



Once you have selected a kind of calibration and pressed the Ok button, the calibration window will appear:



The shortcut keys are used to quickly correct map values. If no cells are selected, correction is applied on the cell(s) that correspond to the current axis value (in the figure above: THROTTLE = 100, RPM = 0 mean the first row, the last four columns).

When one or more cells are modified, they switch to red

0.0	0.0	0.0	0.0	0.0
0.0	5.0	5.0	5.0	0.0
0.0	5.0	5.0	5.0	0.0
0.0	5.0	5.0	5.0	0.0
0.0	5.0	5.0	5.0	0.0
0.0	5.0	5.0	5.0	0.0
0.0	0.0	0.0	0.0	0.0

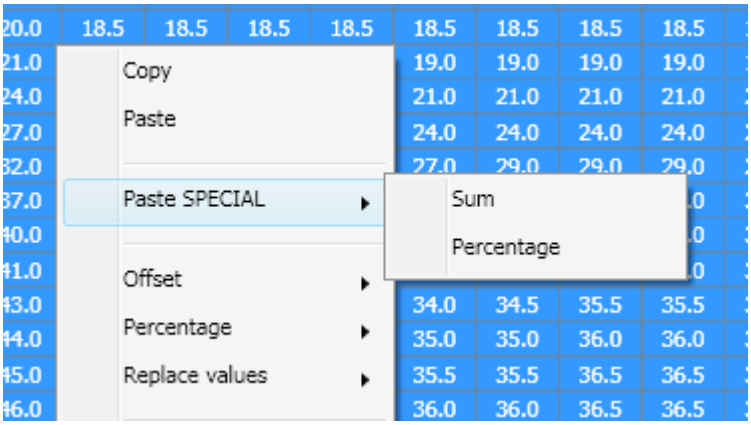
As time passes, the colour of corrected cells become orange, to indicate that the cells value is not the original one, but the correction occurs some seconds ago

0.0	0.0	0.0	0.0	0.0
0.0	5.0	5.0	5.0	0.0
0.0	5.0	5.0	5.0	0.0
0.0	5.0	5.0	5.0	0.0
0.0	5.0	5.0	5.0	0.0
0.0	5.0	5.0	5.0	0.0
0.0	0.0	0.0	0.0	0.0

Cell values can be corrected using *correction* section: just type a value and press the *Send* button. Remember that map values are bounded by the values specified in the *correction bounds* section (to edit a bound value, just double click on a value, edit it and press the *Send* button).

- **Remember to specify only correction values, not desired ones. Correction value may change, depending on map correction type (can be either *Absolute* – means *Offset* - or *Percentage*).**

Once the calibration is done, to apply the corrected value to a map, just select all correction grid values, copy it and paste it on the target map, using *Paste SPECIAL* command



After doing a correction and send the new values to the ECU, remember to reset calibration map.

The bar on the bottom of the window indicates ECU activity: when green, it means that the ECU is sending data to the PC and the PC is receiving them; when red, it means that either the ECU is not sending data to the PC or the PC cannot receive them: check ECU and PC connection.

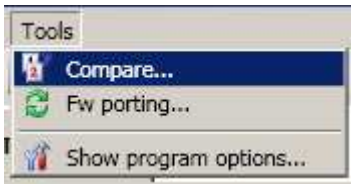
Chapter 6. Toolbar functions

The following functions are available in the toolbar.

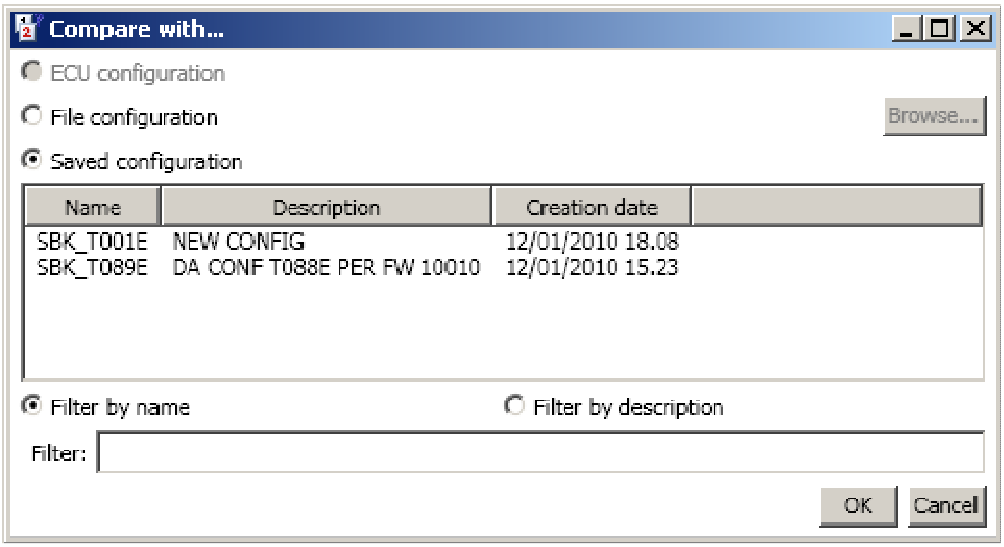
6. 1. Compare

This option compares the active configuration with a chosen one. It is marketed with the icon .

Click on “Tools” in the header menu, then “Compare” option. Or just click on the Compare icon in the toolbar.



Choose the configuration to compare in the following window:



1. ***ECU configuration:*** must be connected to the ECU.
2. ***File configuration:*** browse in the computer folder.

3. ***Saved configuration:*** in the database, there is the list of all the database configuration below.

   There are search filters to simplify the process of selecting the configuration. Just write the word to filter in the text box "*Filter:"* and then choose the criteria:

   - Filter by name.
   - Filter by description.

Click the Ok button to confirm the comparison. The Win Merge opens and shows the comparison. Both configuration are displayed in the screen in .txt format. A colour line emphasized where the configuration are different.

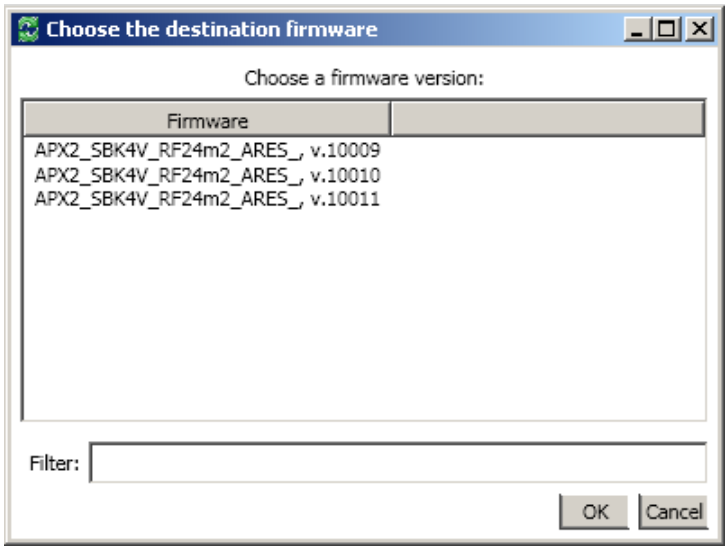
6. 2. Fw porting

The firmware configuration of the ECU and the firmware configuration to transmit to the ECU (active in ARES) must be the same. This option changes the opened firmware configuration in the ARES program.

Click on "Tools" in the header menu, then "Fw porting" option. Or just click on the

icon in the toolbar.

Choose the new firmware configuration in the next window. This is a list with all the firmware configuration in the database.

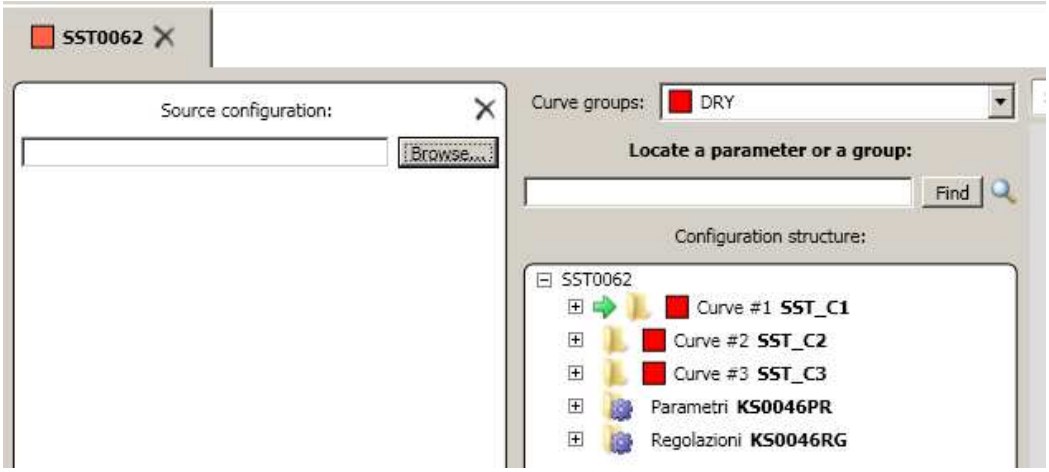


↳ When a configuration is receive from the ECU, its firmware configuration is saved in the database by default.
↳ When you open a configuration from file and then you save it in the database, also the firmware configuration is saved in the database.
↳ In order to know which is the firmware of the ECU click on Show device info.

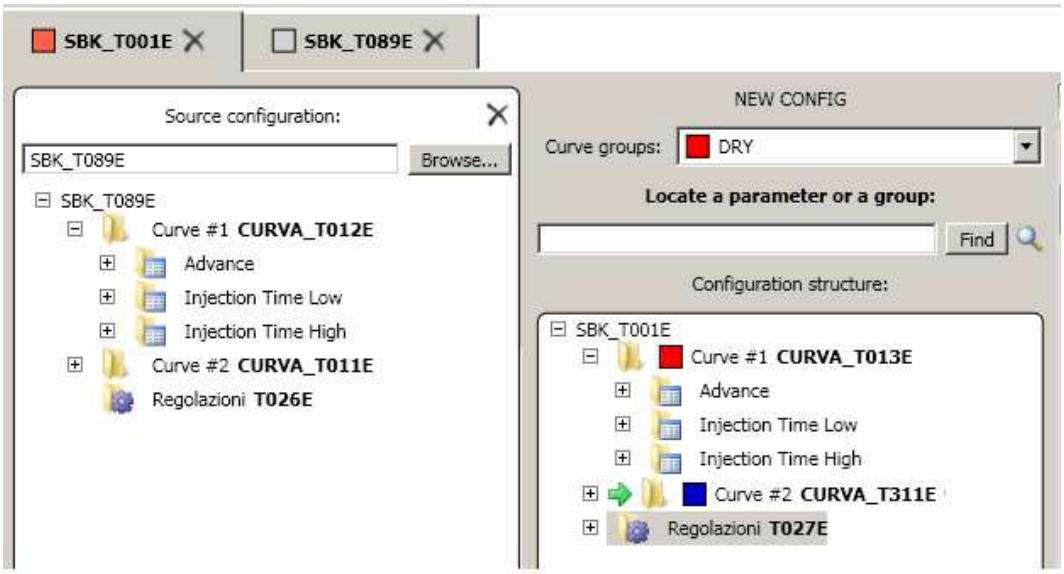
6. 3. Import data

This option imports data from a chosen configuration to the active in the ARES software.

Click on the Import data icon in the toolbar. Next window appears to choose to the configuration to be imported:



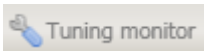
Both configurations to import data:



The importation will be from the left configuration to the right one.

↳ It is only possible to import groups of curves and not a single cylinder advance curve. Even the tuning adjustments (regolazioni) must be imported as a group.

6. 4. Tuning monitor



icon.

This function is only active when the ECU is connected to a PC. See *Chapter 5 Functions when ECU and PC are connected* section *Tuning monitor* for further information.

6. 5. Show device info

icon.

This function is only active when the ECU is connected to a PC. See *Chapter 5 Functions when ECU and PC are connected* section *Show device info* for further information.

6. 6. Show errors

icon.

This function is only active when the ECU is connected to a PC. See *Chapter 5 Functions when ECU and PC are connected* section *Show errors* for further information.

6. 7. Rx configuration and Tx configuration

icon.

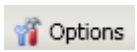
This function is only active when the ECU is connected to a PC. See *Chapter 5 Functions when ECU and PC are connected* section *Transmit and Receive* for further information.

6. 8. Choose curve and tx

icon.

This function is only active when the ECU is connected to a PC. See *Chapter 5 Functions when ECU and PC are connected* section *Choose curve and tx* for further information.

6. 9. Options

Click on “Tools” in the header menu, then “Show program options” option.
Or just click on the 

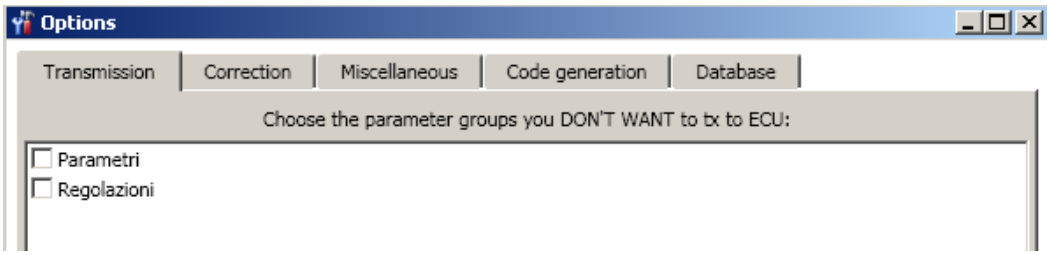
icon in the toolbar.

This window has different tabs:

6. 9. A. Transmission

It is possible to choose what to transmit to the ECU.

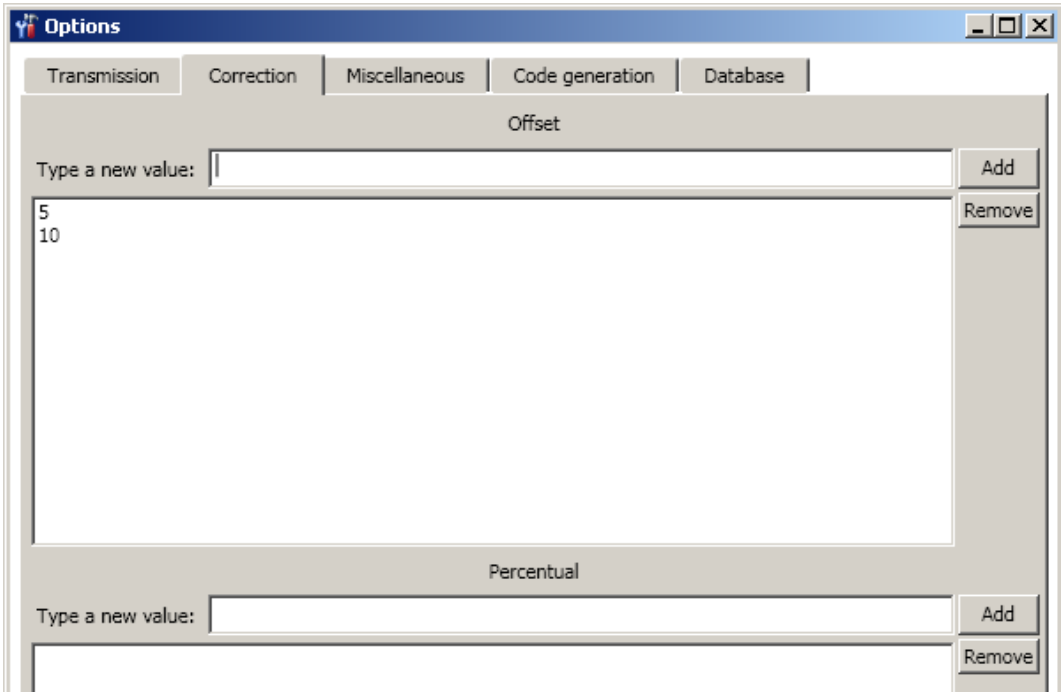
By *activating* the Regolazioni (tuning adjustments) check box: The tuning adjustment group *will **not** be transmit* to the ECU.



The Parametri (parameters) check box is only available for staff Aprilia.

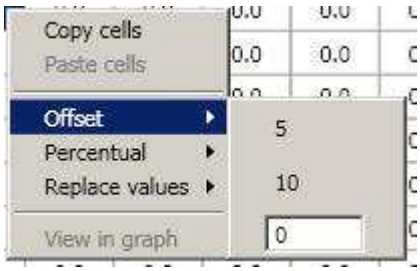
6. 9. B. Correction

This option is related to the engine maps curves. It is possible to set personalised offset and percentage values in order to modify cell values quickly.



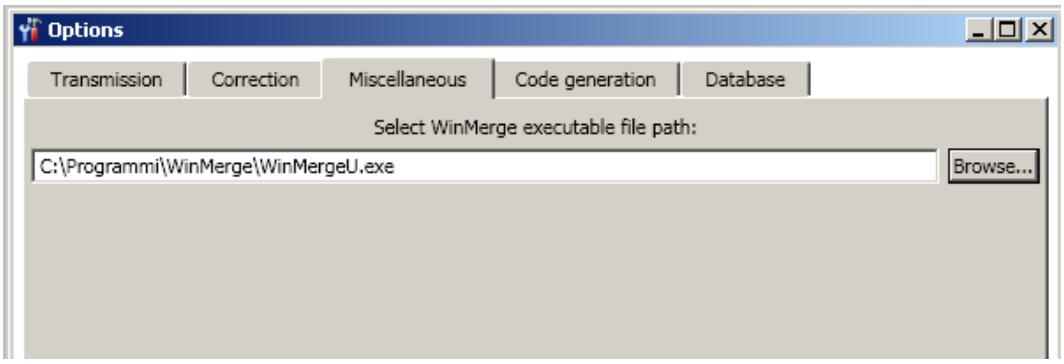
It is possible to manage all personal offsets and percentages.

Write the *new offset* or *percentage* value in the corresponding gap and then click on the “Add” button. Every value will be available by clicking the right mouse button in every map:



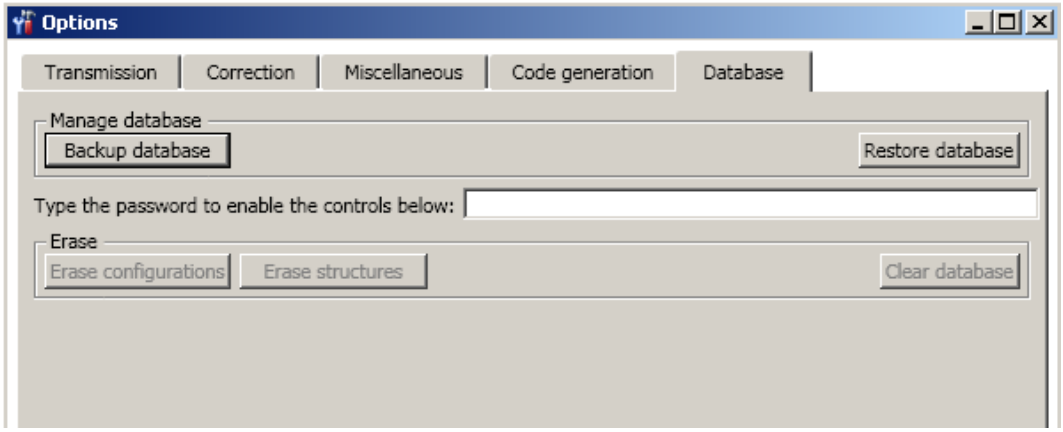
6. 9. C. Miscellaneous

This text box indicates where the program selects the executable file of the Win Merge software. If the user changes the default folder it is necessary to change this path.



6. 9. D. Database

This option allows the user to make a backup of a database or to restore a saved database.



Apendix A Toolbar Icons

Open configuration from data base	Opens an existing configuration in the database.
Save configuration to database	Saves the active configuration in the database.
Print	Prints the active configuration in .txt. form.
Compare	Compares two configurations by using the Win Merge software.
Fw porting	Changes the firmware associated with the configuration.
Import data	Imports data from one configuration to another one.
Tuning monitor	Allows to complete tuning operations with the computer.
Show device info	Shows all information about the ECU
Show errors	Indicates ECU errors.
Show real-time	Open real-time window.
Show calibration	Open calibration window.
ECU:	Shows the name of the ECU when it is connected.
Rx configuration	Receives the configuration of the ECU.
Tx configuration	Transmits the configuration of the ECU.
Choose curve and tx	Choose the active curve to transmit.
Options	